REMARKS

Reconsideration of this application, as amended, is respectfully requested.

THE CLAIMS

Claims 1-10 have been canceled, without prejudice, and claims 11-22 have been added.

New independent claim 11 has been added based on (now canceled) claim 1 and to clarify the features of the present invention whereby the microchemical system measures a fluid sample which is held in a channel; whereby a focal position of the exciting light is located in the channel; whereby a modulator is provided for modulating the exciting light; whereby a single detector is paired with the converging lens to detect the detecting light after the detecting light passes through a thermal lens generated in the fluid sample by the convergent irradiation of the exciting light; and whereby a synchronizing device synchronizes an output signal of the detector with the modulation of the exciting light by the modulator. See the disclosure in the specification at page 9, lines 19-34, page 10, lines 14-27, page 12, lines 9-11, and at page 17, lines 2-5.

In addition, new claims 12-20 have been prepared depending from claim 11 and corresponding respectively to the subject matter of (now canceled) claims 2-10. And new claim 18 clarifies

the feature of the present invention whereby the moving means for moves the optical fiber in a direction parallel to the channel, as supported by the disclosure in the specification at page 15, line 25 to page 16, line 21.

Still further, new claim 21 has been prepared to recite the features of the present invention whereby the microchemical system further comprises a channel-formed element in which the channel is formed, and wherein the converging lens is fixed in opposed relation to the channel-formed element, as supported by the disclosure in the specification at page 10, lines 11-13.

And new claim 22 has been prepared depending from new claim 21 to recite the feature of the present invention whereby the converging lens is fixed in contact with the channel-formed element, as supported by the disclosure in the specification at page 10, lines 11-13, and at page 12, lines 9-21.

No new matter has been added, and it is respectfully requested that new claims 11-22 be approved and entered.

CLAIM FEE

The application was filed with 10 claims, including multiple dependent claims, equivalent to 20 claims in total, and the appropriate fee was paid for the multiple dependent claims. The application now contains 12 claims, including multiple dependent claims, equivalent to 21 claims in total. Accordingly, a claim

fee in the amount of $50.00 for the addition of 1 extra claim in total is attached hereto. In addition, authorization is hereby given to charge any additional fees which may be determined to be required to Account No. 06-1378.

THE PRIOR ART REJECTION

Claims 1-10 were rejected under 35 USC 103 as being obvious in view of the combination of USP 4,927,268 ("Carr et al") and USP 5,513,006 ("Schulz et al"). This rejection, however, is respectfully traversed with respect to new claims 11-22 as set forth hereinabove.

Carr et al is directed to an apparatus for optically analyzing biological material (such as proteins or other macromolecules, cells, viruses, or tissue fragments). To avoid alignment problems, Carr et al discloses that twin beams are transmitted through a common optical fiber.

For example, Carr et al discloses an apparatus comprising a single-mode optical fiber for carrying coincident first and second light beams having first and second wavelengths (i.e. 488nm and 632nm). The light beams propagate down the optical fiber to the free end thereof, where they cross a distance D_1 and enter a gradient index microlens, which may be bonded to the free end of the optical fiber. The two beams are focused on points spaced longitudinally on an axis extending through a detection

zone such that the diameters of the beams are in a changeable ratio. The light scattered from the two beams is measured by respective detectors (see detectors 20 and 22 in Fig. 1, for example).

Carr et al does disclose at column 5, lines 11-18 that the measuring apparatus disclosed therein may be used for thermal lensing. In this case, Carr et al discloses that a thermal lens effect is created by absorption of the pump beam, which is monitored by detector 30 (see Fig. 3), and that the measurement beam is also measured by the measurement detector 20 to measure the thermal lens effect.

Schulz et al, moreover, is directed to a photo-thermal sensor for determining the concentration of a compound in a sample. According to Schulz et al, an excitation light source 4 emits a light beam in a first wavelength and a probe light source 3 emits a light beam in a second wavelength. The two light beams are irradiated onto a sample. An aperture diaphragm is provided behind the sample such that the excitation light beam passes uninhibited, while only the center of the probe light beam is allowed to pass. The diaphragm allows the largest intensity changes generated by the thermal lens to be detected.

According to Schulz et al, light intensity changes generated by the thermal lens are detected by two photo-sensitive detectors 5 and 6. The first detector 5 measures the intensity

of the excitation light source at filter 9a, and the second detector 6 measures the actual signal of the thermal lens.

Thus, as described hereinabove, both Carr et al and Schulz et al disclose optical analysis of a sample via a thermal lens in which two detectors are used to measure the thermal lens effect. According to both Carr et al and Schulz et al, one detector measures the measurement beam, and another measures the pump beam.

By contrast, according to the present invention as recited in new independent claim 11, a microchemical system is provided which comprises a channel for holding a fluid sample, a converging lens for convergently irradiating exciting light and detecting light onto the sample such that a focal position of the exciting light is located in the channel, and an optical fiber for guiding the exciting light and the detecting light to the converging lens. A modulator is provided for modulating the exciting light, and a single detector is paired with the converging lens to detect the detecting light after the detecting light passes through a thermal lens generated in the fluid sample by the convergent irradiation of the exciting light. A synchronizing device then synchronizes an output signal of the detector with the modulation of the exciting light by the modulator.

Thus, according to the present invention as recited in new independent claim 11, a single detector is paired with the

converging lens. With this structure, the construction of the microchemical system can be simplified, and the size of the microchemical system can be minimized.

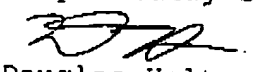
It is respectfully submitted that Carr et al and Schulz et al do not at all disclose, teach or suggest the above described feature of the present invention as recited in new independent claim 11.

Accordingly, it is respectfully submitted that the new independent claim 11, and new claims 12-22 depending therefrom, clearly patentably distinguish over the combination of Carr et al and Schulz et al, under 35 USC 103.

In view of the foregoing, entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned for prompt action.

Respectfully submitted,



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